

Docket 84231AJA
Customer No. 01333

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of
Olivier J. Poncelet, et al

Group Art Unit: 1794

Examiner: David J. Joy

INKJET RECORDING ELEMENT

Serial No. 10/521,898

Filed 14 July 2003

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

Sir:

APPEAL BRIEF PURSUANT TO 37 C.F.R. 41.37 and 35 U.S.C. 134

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APPELLANT'S BRIEF ON APPEAL

Appellants hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection of claims 1-3 and 5-25 which was contained in the Office Action mailed January 07, 2009.

A timely Notice of Appeal was filed May 06, 2009.

Real Party In Interest

The Eastman Kodak Company is the assignee and real party in interest.

Related Appeals And Interferences

No appeals or interferences are known which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

Status Of The Claims

Claims 4 has been cancelled.

Claims 1-3 and 5-25, all the claims presently pending, have been finally rejected on January 7, 2009 and are appealed.

Appendix I provides a clean, double spaced copy of the claims on appeal.

Status Of Amendments

No amendments have been filed subsequent to the final rejection.

Summary of Claimed Subject Matter

Independent claim 1 is directed towards an ink jet recording element comprising a support (page 5, lines 2-12) and at least one ink-receiving layer (page 5, line 14), wherein said ink-receiving layer comprises at least one hydrosoluble binder (page 5, lines 15-21) and at least one hybrid aluminosilicate polymer (page 5, line 22 – page 11, line 27) obtained by a preparation method that comprises the following steps:

- a) treating a mixed aluminum and silicon alkoxide (page 6, line 9- page 7, line 25) of which the silicon has both hydrolyzable substituents (page 4, lines 7-8) and a non-hydrolyzable substituent (page 4, lines 3-7), or a

mixed aluminum and silicon precursor (page 6, line 9- page 7, line 25) resulting from the hydrolysis of a mixture of aluminum compounds and silicon compounds only having hydrolyzable substituents and silicon compounds having a non-hydrolyzable substituent, with an aqueous alkali (page 8, lines 4-19), in the presence of silanol groups (page 8, lines 11-19), the aluminum concentration being maintained at a concentration from 1.4×10^{-2} to 0.3 mol/l (page 8, line 1), the Al/Si molar ratio being maintained between 1 and 3.6 (page 7, line 30), and the alkali/Al molar ratio being maintained between 2.3 and 3 (page 7, lines 30-31);

- b) stirring (page 8, lines 20-23) the mixture resulting from step a) at a temperature of from 15°C to 35°C (page 7, lines 21-22) in the presence of silanol groups long enough to form the hybrid aluminosilicate polymer; and
- c) eliminating the byproducts (page 8, lines 24–30) formed during steps a) and b) from the reaction medium.

Grounds of Rejection to be Reviewed on Appeal

1. Claims 1-3 and 5-25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US 6,548,149) in view of Poncelet et al. (US 5,916,946).

Arguments

Rejection of Claims 1-3 and 5-25 under 35 U.S.C. 103(a) as being unpatentable over Liu et al. in view of Poncelet et al.

The asserted rejection represents clear error, as the present claims require use of a hybrid aluminosilicate polymer obtained by a specified preparation method by either treating a mixed aluminum and silicon alkoxide of which the silicon has both hydrolyzable substituents and a non-hydrolyzable substituent, or a mixed aluminum and silicon precursor resulting from the hydrolysis of a mixture of aluminum compounds and silicon compounds only

having hydrolyzable substituents and silicon compounds having a non-hydrolyzable substituent, with an aqueous alkali, in the presence of silanol groups. In accordance with the invention, the presence of such non-hydrolyzable group results in a hybrid aluminosilicate polymer, i.e., an aluminosilicate which by definition retains such non-hydrolyzable group covalently bonded to silicon (see, e.g., definition of “non-hydrolyzable substituent” expressly set forth at page 4, lines 3-8 of the specification, where it is explained that such non-hydrolyzable substituent does not separate from the silicon atom during the process, while hydrolysable substituents are eliminated by hydrolysis in the same conditions). **Use of such a hybrid aluminosilicate polymer obtained from silicon compounds having non-hydrolyzable substituents is clearly not taught or suggested by either of Lie et al or Poncelet et al., as such references only disclose use of fully alkoxyated (i.e., all hydrolyzable groups) silicon compounds in the preparation of the aluminosilicates thereof (see, e.g., use of ethyl orthosilicate at col. 23, line 15 of Liu et al, and $\text{Si}(\text{OCH}_3)_4$ at col. 4, line 33 of Poncelet et al).** The further presence of a water soluble organic polymer during the formation of the aluminosilicate in Poncelet et al. does not result in a hybrid aluminosilicate polymer itself as is obtained for the described product-by process compositions (i.e., an aluminosilicate polymer with by definition necessarily retained non-hydrolyzable substituents bonded to silicon atoms of the hybrid aluminosilicate polymer) as employed in the present invention, but rather Poncelet et al. discloses a conventional polymeric aluminosilicate in an organic polymeric matrix. Thus, such aluminosilicate polymers themselves are clearly distinct, and neither Liu et al or Poncelet et al suggest the use of a hybrid aluminosilicate polymer in accordance with the present invention.

The Examiner's comments in the Advisory Action mailed April 20, 2009 that there is “nothing in the claimed product portion of the present claims that positively recites the presence of hydrolysable and non-hydrolyzable substituents groups in the formed aluminosilicate polymer product” thus represents clear error, as the claimed product-by-process composition requires use of non-hydrolyzable substituents in the compounds used to form the hybrid

aluminosilicate polymer, and as non-hydrolyzable substituents are expressly defined in the specification as being substituents that are not separated from the silicon atom during the described method of formation of the hybrid aluminosilicate polymer. With respect to the Examiner's comments as to any requirement for presence of hydrolysable substituent groups in the formed aluminosilicate polymer, it is further noted that such comment is also in error, as to the contrary, while such hydrolysable substituent groups are present in the starting compounds employed in the described method, such hydrolysable substituents are eliminated by hydrolysis during the method of preparing the hybrid aluminosilicate polymer as expressly noted at page 4, lines 7-8. Thus, the non-hydrolyzable substituents by definition are necessarily present in the resulting "product-by-process" defined hybrid aluminosilicate polymer. Accordingly, even if one were to employ the "composite" product of Poncelet et al in the ink jet recording material of Liu et al. as proposed by the Examiner, the present claimed invention employing a hybrid aluminosilicate polymer (with by definition necessarily retained non-hydrolyzable substituents bonded to silicon atoms) still would not be obtained. Thus, the proposed rejection represents clear error, and reversal thereof is respectfully urged.

The Examiner further argues in the Advisory Action that there is nothing taught by the present specification that defines what is meant by an ink jet recording element having an ink-receiving layer that comprises at least one hydrosoluble binder and at least one hybrid aluminosilicate polymer, and that there is nothing claimed that would lead the skilled artisan to conclude that claiming a hybrid aluminosilicate polymer requires that the polymer has retained both hydrolysable and non-hydrolyzable substituent groups. While the Examiner's comments as to retained hydrolyzable substituents are again in clear error, the meaning of hybrid aluminosilicate polymers obtained from a compound having non-hydrolyzable substituents is clear based on the above explanation, and as further described, e.g., at page 4, lines 16-18 ("This is the non-hydrolyzable substituent that will be found again in the hybrid aluminosilicate polymer material..."); and at page 8, line 30 to page 9, line 2 ("The introduction of non-hydrolyzable substituents, such as organic functions,

enables providing for example an organophilic character to the resulting hybrid aluminosilicate polymers”) of the specification.

The Examiner argues that while Applicant argues that Liu and Poncelet disclose a different product than the product obtained by the specified preparation method that is presently claimed, Applicant has produced no dispositive evidence to support this position, as the present claims are drawn to an article/product that comprises a polymer obtained by a specified preparation method, and as the patentability of a product does not depend on its method of production. The Examiner’s position again represents clear error, as no consideration has been given by the Examiner to the specified starting materials as required for the claimed product-by-process, in combination with the express definition of the “non-hydrolyzable substituent” as required for the specified starting materials. Together, such requirements by definition necessarily result in a hybrid aluminosilicate polymer that has retained non-hydrolyzable substituents, which is clearly a different product than that obtained in the cited prior art. Applicants have requested the Examiner to identify where in either of such references use of such a hybrid aluminosilicate polymer obtained from a silicon compound with a non-hydrolyzable group (which by definition is necessarily retained) is taught, but the Examiner has failed to identify any such disclosure in the applied references.

The above explanation is believed sufficient to establish the clear error of the rejection. Regarding the Examiner’s further statement that if the product in a “product-by-process” claim is the same as or obvious from a product of the prior art the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product, in addition to the compositional difference explained above (and thus, the product is not the same as the prior art product) Applicants have further explained that the Examples of the present application further clearly demonstrate improved performance with respect to dye keeping properties and gloss for ink jet recording elements employing a hybrid aluminosilicate polymer in accordance with the invention (e.g., Examples 8-

12) in comparison to use of aluminosilicate polymers prepared without non-hydrolyzable groups (Example 7). The Examiner has further failed to address such showing of unexpected results.

While it is believed clear in view of the above comments that the proposed combination of teachings of Liu et al and Poncelet et al. would not result in the claimed invention, it is still further maintained that such combination would further in any event not have been suggested to one skilled in the art as Poncelet et al is directed towards use of organic/inorganic composites as antistatic components for a photographic product, while Liu et al is directed towards ink jet recording materials. While the Examiner argues in the Advisory Action that a reference maybe relied on as a basis for rejection of an applicant's invention if it is "reasonably pertinent to the particular problem with which the inventor is concerned", or if "it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem", the Examiner still fails to propose any justification as to why an improvement in antistatic materials designed for use in photographic materials (as is the subject of Poncelet et al) would be "reasonably pertinent" to the problem addressed by Applicants or Liu et al, or logically would have commended itself to Applicant's or Liu's attention in considering their problems for use in an ink jet recording material. Applicant's invention and Liu et al have nothing to do with photographic elements, and the aluminosilicate materials employed in Applicant's invention and Liu et al are not disclosed as being used for antistatic purposes, as is the use in Poncelet et al. Accordingly, there has been no reasonable motivation proposed for the proposed combination (simply noting that both references relate to "imaging elements" clearly falls far short as to providing any motivation to combine the teachings thereof, where the materials are used for different purposes in each application), and a prima facie case of obviousness for such combination has not been established. Again, Applicant maintains in any event that even if such teachings were to be combined, the present claimed invention still would not be obtained as explained above.

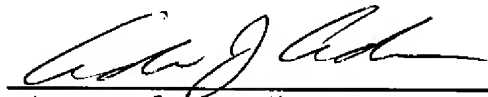
Summary

Poncelet et al teaches a composite based on an organic polymer and a polymeric aluminosilicate, not a hybrid aluminosilicate polymer itself obtained from starting materials that comprise a non-hydrolyzable substituent that by definition is not removed during the hybrid polymer formation method. As the aluminosilicate in Poncelet et al is not prepared from silicon precursor that has a non-hydrolyzable substituent, the aluminosilicate polymer obtained in Poncelet et al is distinct from that employed in the present invention. Thus, the use of a composite product as taught in Poncelet in the ink jet recording material of Liu et al would not result in the present claimed invention. Further, Poncelet et al is in any event directed towards use of such composite materials as antistats in photographic elements, and does not suggest their use ink jet recording materials. The rejection represents clear error, and reversal of the rejection is accordingly strongly urged.

Conclusion

For the above reasons, Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the rejection by the Examiner and mandate the allowance of Claims .

Respectfully submitted,



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Enclosures

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

Appendix I - Claims on Appeal

1. (Previously presented) An ink jet recording element comprising a support and at least one ink-receiving layer, wherein said ink-receiving layer comprises at least one hydrosoluble binder and at least one hybrid aluminosilicate polymer obtained by a preparation method that comprises the following steps:

- d) treating a mixed aluminum and silicon alkoxide of which the silicon has both hydrolyzable substituents and a non-hydrolyzable substituent, or a mixed aluminum and silicon precursor resulting from the hydrolysis of a mixture of aluminum compounds and silicon compounds only having hydrolyzable substituents and silicon compounds having a non-hydrolyzable substituent, with an aqueous alkali, in the presence of silanol groups, the aluminum concentration being maintained at a concentration from 1.4×10^{-2} to 0.3 mol/l, the Al/Si molar ratio being maintained between 1 and 3.6 and the alkali/Al molar ratio being maintained between 2.3 and 3;
- e) stirring the mixture resulting from step a) at a temperature of from 15°C to 35°C in the presence of silanol groups long enough to form the hybrid aluminosilicate polymer; and
- f) eliminating the byproducts formed during steps a) and b) from the reaction medium.

2. (Previously presented) The recording element according to Claim 1, wherein the alkali of step a) to prepare the hybrid aluminosilicate polymer is selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide, diethylamine, and triethylamine.

3. (Original) The recording element according to Claim 1, wherein the silanol groups used to prepare the hybrid aluminosilicate polymer are supplied in silica or glass bead form.

4. (Cancelled)

5. (Original) The recording element according to Claim 1, wherein the aluminum concentration used to prepare the hybrid aluminosilicate polymer is maintained between 4.3×10^{-2} and 0.3 mol/l.

6. (Original) The recording element according to Claim 1, wherein said alkali/Al molar ratio to prepare the hybrid aluminosilicate polymer is about 2.3.

7. (Original) The recording element according to Claim 1, wherein said alkali/Al molar ratio to prepare the hybrid aluminosilicate polymer is about 3.

8. (Original) The recording element according to Claim 1, wherein the method for preparing the hybrid aluminosilicate polymer comprises, after step b) and before step c), a step d), by which alkali is added in order to reach an alkali/Al molar ratio of 3 if this ratio has not already been reached in step a).

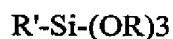
9. (Original) The recording element according to Claim 1, wherein said mixed aluminum and silicon precursor resulting from hydrolysis of a mixture of aluminum compounds and silicon compounds only having hydrolyzable substituents and silicon compounds having a non-hydrolyzable substituent is a product resulting from the mixture in an aqueous medium (i) of a compound selected from the group consisting of aluminum salts, aluminum alkoxides and aluminum halogenoalkoxides and (ii) at least one compound selected from the group consisting of silicon alkoxides and chloroalkoxides only having hydrolyzable substituents, and (iii) at least one compound selected from the group consisting of silicon alkoxides and chloroalkoxides having a non-hydrolyzable substituent.

10. (Original) The recording element according to Claim 9, wherein said mixed aluminum and silicon precursor is the product resulting from the mixture (i) of an aluminum halide and (ii) a mixture having at least one silicon alkoxide only having hydrolyzable substituents and at least one silicon alkoxide having a non-hydrolyzable substituent.

11. (Original) The recording element according to Claim 10, wherein the ratio of silicon alkoxide only having hydrolyzable substituents to silicon alkoxide having a non-hydrolyzable substituent is between 0.1 and 10 in moles silicon.

12. (Original) The recording element according to Claim 11, wherein the ratio of silicon alkoxide only having hydrolyzable substituents to silicon alkoxide having a non-hydrolyzable substituent is 1 in moles silicon.

13. (Original) The recording element according to Claim 9, wherein the silicon alkoxide having a non-hydrolyzable substituent is represented by the formula



wherein

R represents an alkyl group comprising 1 to 5 carbon atoms

R' represents H, F, or a substituted or unsubstituted non-linear or ramified alkyl or alkenyl group comprising 1 to 8 carbon atoms.

14. (Original) The recording element according to Claim 13, wherein R' represents a methyl, ethyl, n-propyl, n-butyl, 3-chloropropyl, or vinyl group.

15. (Original) The recording element according to Claim 14, wherein said silicon alkoxide having a non-hydrolyzable substituent is methyltriethoxysilane or vinyltriethoxysilane.

16. (Original) The recording element according to Claim 10, wherein said silicon alkoxide only having hydrolyzable substituents is tetramethyl orthosilicate or tetraethyl orthosilicate.

17. (Original) The recording element according to Claim 1, wherein the method for preparing the aluminosilicate polymer comprises, after step c), a step e), by which at least one chelating agent of aluminum is added to the hybrid aluminosilicate polymer resulting from step c).

18. (Original) The recording element according to Claim 17, wherein step e) is applied directly on the hybrid aluminosilicate polymer resulting from step c) to prepare a hybrid aluminosilicate polymer resulting from step e) or when a coating composition for the preparation of the ink-receiving layer is prepared by using a hybrid aluminosilicate polymer resulting from step c).

19. (Original) The recording element according to Claim 17, wherein said chelating agent of aluminum is selected from the group consisting of carboxylic acids, phosphonic acids, sulfonic acids, difunctional acids, their ester and anhydride components and amino acids.

20. (Original) The recording element according to Claim 19, wherein said chelating agent of aluminum is selected from the group consisting of HCOOH , R_1COOH wherein R_1 is selected from the group consisting of $\text{CH}_3(\text{CH}_2)_n$, n being between to 0 and 12, CF_3 , C_6H_5 , $(\text{C}_6\text{H}_5)_2$, substituted aromatic rings, $\text{C}_4\text{H}_4\text{S}$; $\text{R}_2\text{PO}(\text{OH})_2$ wherein R_2 is selected from the group consisting of CH_3 , C_6H_5 , $\text{R}_3\text{SO}_3\text{H}$ wherein R_3 is $\text{CH}_3(\text{CH}_2)_n$, n being between to 0 and 5; $\text{HOOC}(\text{CH}_2)_n\text{COOH}$, $n = 0-8$; aromatic difunctional acids; $\text{HOOC}(\text{CH}_2)_n\text{PO}(\text{OH})_2$, $n = 2, 4$; hydroxy aliphatic acids; $\text{HOOC}(\text{CH}_2\text{OH})_n\text{COOH}$, $n = 1-2$; $\text{CH}_3\text{CH}(\text{NH}_2)\text{COOH}$.

21. (Original) The recording element according to Claim 17, wherein step e) comprises a first adding of acetic acid and a following adding of another different chelating agent of aluminum.

22. (Original) The recording element according to Claim 17, wherein the amount of the chelating agent in the ink-receiving layer corresponds to a molar ratio between the chelating functions of the chelating agent and aluminum of the hybrid aluminosilicate polymer, and wherein this molar ratio is greater than 0.1.

23. (Original) The recording element according to Claim 1, wherein said ink-receiving layer comprises between 5 and 95 percent by weight of hybrid aluminosilicate polymer compared with the total weight of the dry ink-receiving layer.

24. (Original) The recording element according to Claim 1, wherein the hydrophilic binder is gelatin or polyvinyl alcohol.

25. (Original) A coating composition for the preparation of ink-receiving layers for the ink jet recording element according to Claim 1.

None.

Appendix II - Evidence

Appendix III – Related Proceedings

Not applicable.